

HIGH SPEED DC INTEGRATED AMPLIFIER

# KA-601

INSTRUCTION MANUAL



 **KENWOOD**

## INTRODUCTION

The purpose of this manual is to acquaint you with the operating features of your new amplifier. You will notice that in every detail of planning, engineering, styling, operating convenience, and adaptability, we have sought to anticipate your needs and desires.

We suggest that you read this manual carefully. Knowing how to set up your amplifier to the best advantage will enhance your listening pleasure right from the start. You will also become aware of the ease with which you can adjust your amplifier to meet your special requirements.

## FOR YOUR RECORDS

Record the serial number, found on the back of the unit, in the spaces designated on the warranty card, and in the space provided below. Refer to the model and serial numbers whenever you call upon your Kenwood dealer for information or service on this product.

Model KA-601 Serial number \_\_\_\_\_

## AFTER UNPACKING

After unpacking, we recommend you inspect and examine the unit for any possible shipping damage. If your unit is damaged or fails to operate, notify your dealer immediately. If your unit was shipped to you directly, notify the shipping company without delay. Only the consignee (the person or company receiving the unit) can file a claim against the carrier for shipping damage.

We recommend that you retain the original carton and packing materials to prevent any damage should you transport or ship your unit in the future.

## INSTALLATION PRECAUTIONS

- Avoid locations subject to direct sunlight.
- Avoid high or low temperature extremes.
- Keep the unit away from heat radiating sources.
- Choose a location that is relatively free of vibration or excessive dust.
- Make sure power is off before making any system connections.

## WARNING:

**TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.**

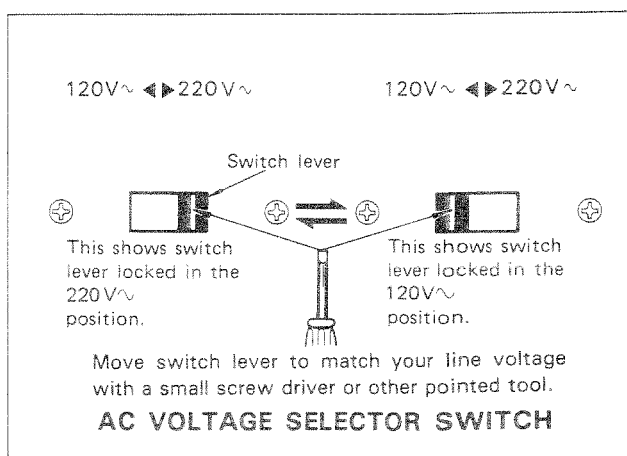
## IMPORTANT!

### AC VOLTAGE SELECTION

This unit operates on 120 volts or 220 volts AC. The AC Voltage Selector Switch on the rear panel is set to the voltage that prevails in the area to which the unit is shipped. Before connecting the power cord to your AC outlet, make sure that the setting position of this switch matches your line voltage. If not, it must be set to your voltage in accordance with the following direction.

#### Note:

Our warranty does not cover damage caused by excessive line voltage due to improper setting of the AC Voltage Selector Switch.



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## FEATURES

### 1. THE MEANING OF "HIGH SPEED"

In the continuing search for perfect sound, recent research has focused on a form of distortion that occurs when sound transients force the amplifier to deliver very large changes in voltage in less than a millionth of a second. To counter this cause of distortion, Kenwood engineers have incorporated a new active device into output-stage design. The result is an amplifier that can respond to a change in output from a very low value to near maximum (the specification called rise time) in 0.9 microseconds. The voltage rate-of-change, called slew rate, is an unprecedented 110 volts per microsecond in both the positive and negative directions. These values of rise time and slew rate represent an improvement factor of 4 to 10 over conventional amplifiers. The result is preservation of tonal quality through the most complex of musical crescendos.

### 2. ULTIMATE DC AMPLIFIER "DC COUPLED"

Listening tests have shown that low-frequency phase shift can be detected as a change in tonal timbre. To prevent phase shift and preserve low-frequency tonal quality the amplifier employs DC coupling throughout the amplifier chain, from the tuner, tape, and aux inputs to the speakers. Kenwood's leadership and experience with DC design techniques ensures perfect and stable operation right down to zero Hertz. The phono input employs one AC coupling device (a capacitor) but this does not affect the operation of the equalizer and power amplifiers that follow, since magnetic phono cartridges do not respond to static stylus pressure.

For those program sources that produce unwanted sound in the extreme low-frequency range, such as rumble, coupling can be switched out at the tuner, tape and aux inputs.

### 3. TWO INDEPENDENT POWER SUPPLIES

The KA-601 operates as two independent monophonic amplifiers, one for each stereo channel and each powered

by its own individual power supply. This eliminates a form of distortion known as dynamic crosstalk when the power demands in one channel act to lower power to the other. By maintaining complete power independence, this notable form of distortion is avoided. In addition, extra solid-state regulators supply power to the preamps so that low-level signal processing is unaffected by the large power demands at the output stages.

### 4. HIGH PERFORMANCE PHONO EQUALIZER

A newly-designed equalizer employing high performance FETs achieves precision equalization to match RIAA record characteristics and moving-magnet cartridges. Using a single input coupling capacitor, the equalizer achieves an outstanding 87 dB signal-to-noise ratio while distortion is reduced to the vanishing point.

### 5. PRECISION TONE CONTROLS

Recently-developed operational amplifier ICs used in a unity-gain negative-feedback RC system maintain low distortion and close control of tone contours at all tone control settings.

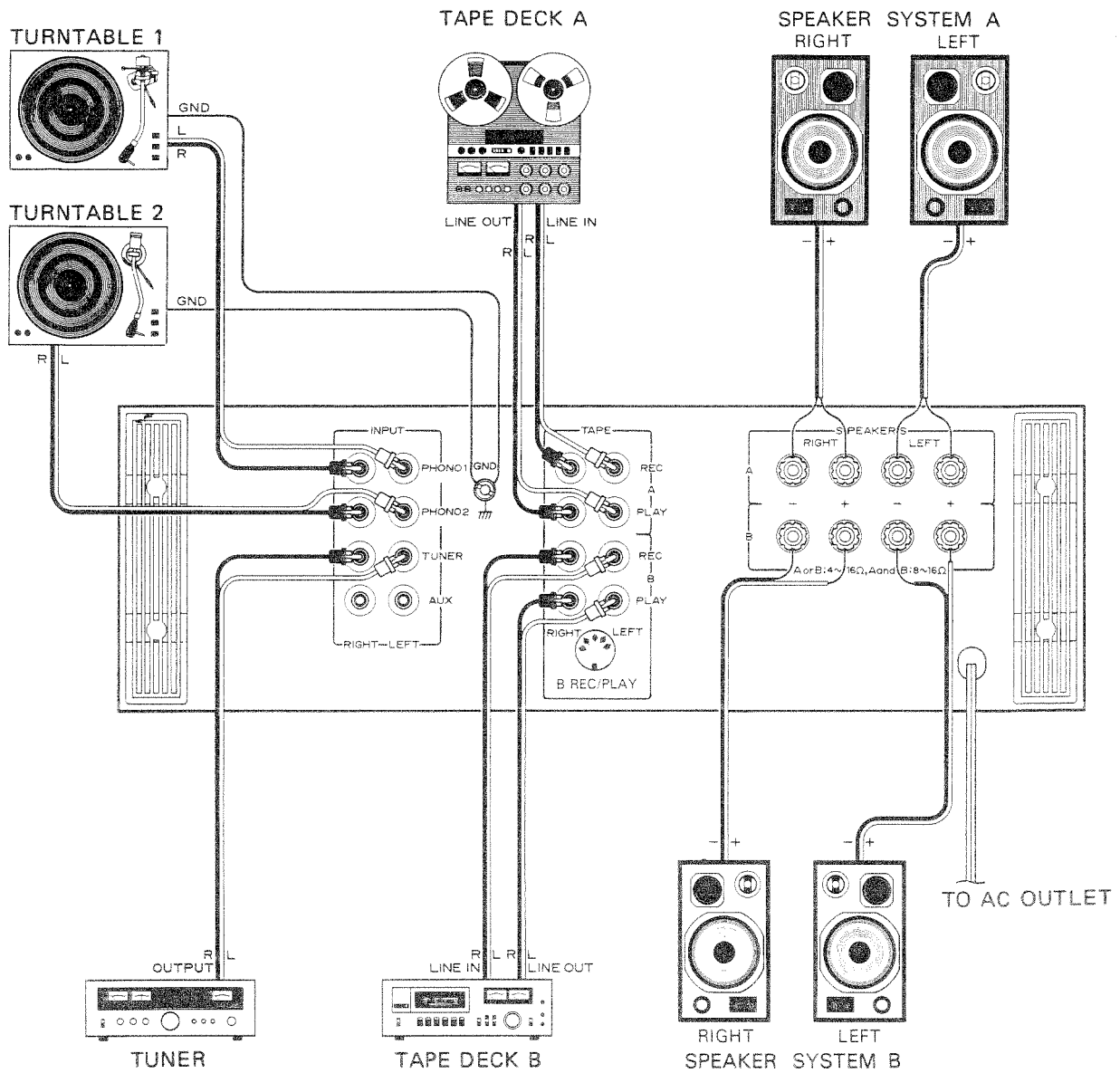
### 6. SPECIAL TAPE-THROUGH SYSTEM

For maximum convenience the tape switching circuits have been set up to provide normal tape operations using a pair of tape decks. The unique tape-through feature permits tape dubbing from one deck to the other without tying up the entire system. Tuner, phono or other sources can drive the speakers while tape dubbing is in progress.

### 7. DUAL SPEAKER OPERATION

The KA-601 will drive one or two pairs of speakers. Each pair can be selected for individual use or they can be driven simultaneously.

# SYSTEM CONNECTION DIAGRAM



# SYSTEM CONNECTIONS

## SPEAKERS

If only one set of speakers is to be connected, make connections to the terminals marked **SPEAKERS A**, as shown on page 4. Connect the speakers to the **RIGHT** and **LEFT** terminals in accordance with the location selected for each speaker. To ensure correct speaker phasing, observe polarity marks; connect terminals marked **+** on the amplifier to similarly-marked speaker terminals. Do the same for amplifier and speaker terminals marked with a minus sign. Reversal of speaker leads will result in loss of bass tones and poor stereo separation.

If a second set of speakers is to be used make connections at the lower set of terminals, marked **B**.

When connecting the speaker leads to the speaker terminals, make sure that the bare wire strands at the ends of the speaker leads do not touch the adjacent terminal.

It is recommended that the tips of the speaker leads be soldered, or the strands of individual leads be twisted together to eliminate any possibility of short-circuits forming in the speaker connecting network.

### Note:

If a single pair of speakers is to be used, each speaker must be rated at 4 ohms or more.

When two pairs of speakers are connected (**A + B**) each speaker must be rated at 8 ohms or more.

## TURNTABLES

Your stereo turntable has two audio cables that are terminated with phono plugs. Plug the left channel plug into the **"LEFT"** and the right channel plug into the **"RIGHT"** **PHONO 1 INPUT** jacks as shown on page 4.

If an additional turntable is to be used, make similar connections at the **PHONO 2** jacks.

If the turntable has a ground wire, connect it to the unit's **GND** terminal to avoid hum.

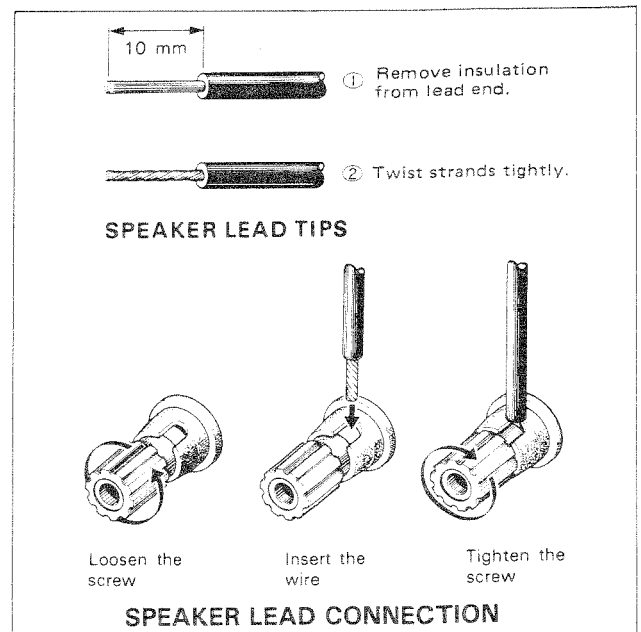
## TUNERS

Use the **TUNER** terminals for connection to an FM stereo or AM-FM stereo tuner.

Connect the left channel of the tuner to the **"LEFT"** **TUNER INPUT** jack and the right channel of the tuner to the **"RIGHT"** **TUNER INPUT** jack.

## AUX JACKS

**INPUT AUX** jacks are used to connect other high-level signal sources, such as tuners, extra tape decks (equipped with preamps), TV or VTR sound outputs,



mic preamps, etc.

## TAPE DECKS

If only one tape deck is to be connected to the system it is recommended that it be connected to the jacks marked **TAPE A**.

Tape deck input and output cables are normally terminated with phono plugs.

### Playback

Plug the left and right output cables of the tape deck into the **"LEFT"** and **"RIGHT"** **TAPE A PLAY** jacks.

### Record

Plug the left and right input cables of the tape deck into the **"LEFT"** and **"RIGHT"** **TAPE A REC** jacks.

### DIN Connector

If your tape deck is equipped with a DIN connector, connect it to the **TAPE B REC/PLAY** connector with the DIN connecting cord. The DIN connection makes both input and output connections with a single cord, and the signal must be controlled with the **TAPE** switch on the front panel.

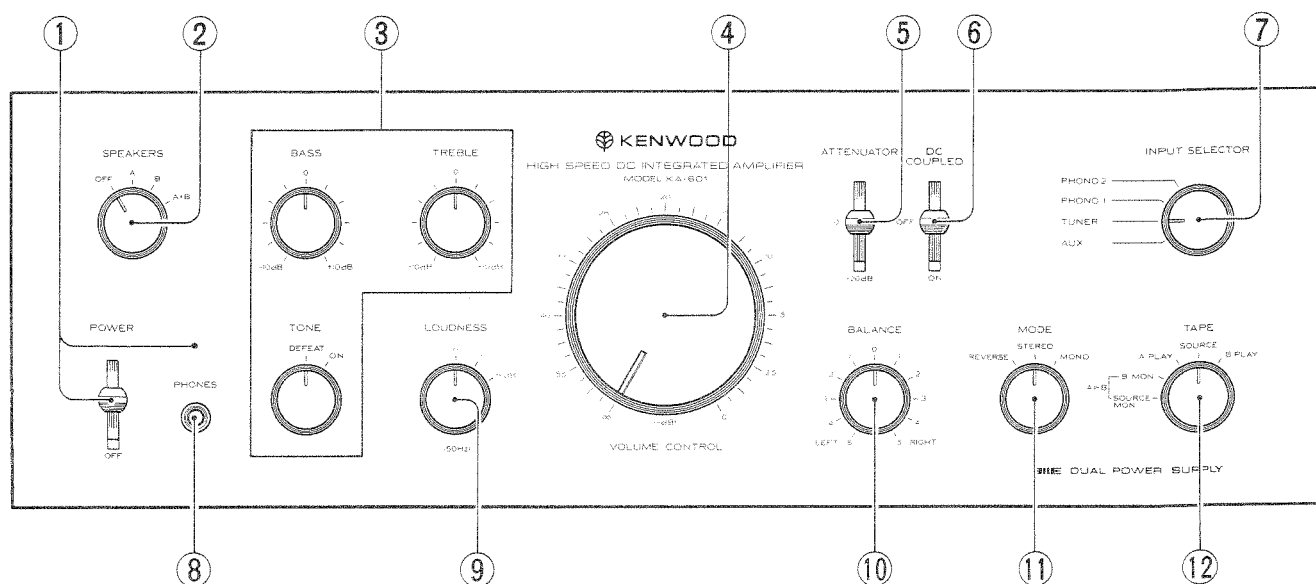
### Note

If connections are made with a DIN connecting cord, the **TAPE B PLAY** and **REC** jacks should not be used.

### Second Tape Deck

Plug the input and output cables from the second tape deck into the **REC** and **PLAY** jacks marked **TAPE B**.

# CONTROLS, INDICATORS AND CONNECTORS



## ① POWER switch

**ON** — turns the amplifier on.  
**OFF** — turns the amplifier off.  
 Power LED glows when power is ON.

## ② SPEAKERS switch

**OFF** — This position silences all speakers to permit private use of headphones.  
**A** — Activates speakers connected to the SPEAKERS A terminals on the rear panel.  
**B** — Activates speakers connected to the SPEAKERS B terminals on the rear panel.  
**A + B** — Activates speakers connected to the SPEAKERS A and B terminals simultaneously.

## ③ TONE controls

The BASS and TREBLE controls are for adjusting the bass and treble response. This is a click-step type control graduated in 2.0 dB steps. Each knob controls both left and right channels equally. Turning the knobs clockwise increases bass and treble response and counterclockwise decreases bass and treble response.

Setting the TONE switch to DEFEAT provides completely flat frequency response with tone control circuits deactivated and BASS and TREBLE controls activated when this switch is set ON.

## ④ VOLUME Control

This control adjusts left- and right-channel volume simultaneously. Set it for the desired listening level. The scale is provided with dB graduations to indicate attenuation when maximum output level corresponds to 0 dB.

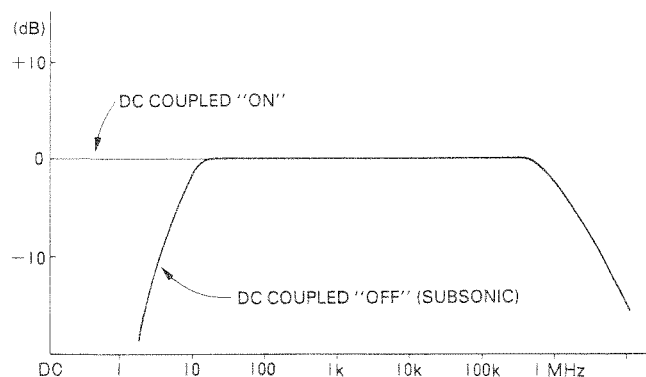
## ⑤ ATTENUATOR switch

Set to -20 dB to attenuate the audio output by 20 dB. This convenient feature saves having to disturb the VOLUME control, for example, when answering the telephone.

## ⑥ DC COUPLED switch

Switch ON to obtain DC (direct) coupling through all amplifier circuits from the Tuner, Tape and Aux inputs to the speaker terminals. A single coupling capacitor is inserted into the chain for Phono operation only. This provides a totally flat response for low frequency tones. The equalizer and DC power amplifier chains are in use for Phono operation, but the input circuits are AC coupled. (Magnetic phono cartridges do not respond to DC or static values). With the switch set to OFF, a single coupling capacitor is inserted into the Tuner, Tape and Aux inputs. This capacitor is also put into the Phono chain for a total of two capacitors. Use this setting to eliminate low-frequency rumble from the program source such as might be caused by warped records. Always switch to OFF if a static DC leak is suspected at the input due to a circuit fault or imbalance in the program source. A DC leak will cause a steady displacement of the speaker voice coil. Refer to Fig. as follows.

# CONTROLS, INDICATORS AND CONNECTORS



## ⑦ INPUT SELECTOR switch

Switch positions and functions are as follows:

**AUX** — Selects source connected to the AUX jacks.

**TUNER** — Selects the tuner connected to the TUNER input jacks on the rear panel.

**PHONO 1** — Selects the turntable connected to the PHONO 1 input jacks on the rear panel.

**PHONO 2** — Selects the turntable connected to the PHONO 2 input jacks on the rear panel.

## ⑧ PHONES jack

Plug stereo headphones into this jack for private listening. The speakers are silenced when the **SPEAKERS** switch is set to OFF.

## ⑨ LOUDNESS control

The **LOUDNESS** control compensates for a natural deficiency in human hearing whereby we are less sensitive to bass notes at low volume levels. This three position switch provides a 3 or 6 dB boost at 50 Hz. Set it for best bass response at the listening level you have selected. At the 0 setting response is flat. Use this setting for loud listening levels.

## ⑩ BALANCE control

This control permits balancing of left and right channels when an imbalance exists from the sound source, or to correct acoustic imbalance due to room conditions. Turn it to the left from the zero position to boost the left channel; turn it to the right of zero to raise the level of the right channel.

## ⑪ MODE switch

Switch positions and functions are as follows:

**STEREO** — This provides stereophonic reproduction of any stereo program source. The left channel is heard from the left speaker, and the right channel is heard from the right speaker.

**REVERSE** — Stereophonic reproduction with reversed channels: left channel to right speaker, right channel to left speaker.

**MONO** — Monophonic reproduction. The left and right channels are mixed together and heard from both speakers.

## ⑫ TAPE switch

**PLAY:** \_\_\_\_\_

**SOURCE** — The signal applied to the record terminals of a tape deck is heard.

**A PLAY** — To monitor a recording in progress or to playback a tape from a tape deck connected to the TAPE A jacks.

**B PLAY** — To monitor a recording in progress or to playback a tape from a tape deck connected to the TAPE B jacks.

**DUBBING (A ▷ B)** \_\_\_\_\_

Facilitates the making of copies (dubs) of taped programs. Two tape decks are required, one to playback the tape, the other to record the copy.

**B MON** — During the dubbing operation from tape deck A to tape deck B, the output of tape deck B is monitored while the recording is in progress.

**SOURCE MON** — This setting permits other program sources (tuner, phono, aux) to be heard while the A-to-B tape dubbing operation is in progress.

# OPERATING INSTRUCTIONS

## INITIAL SETUP

Set controls and switches as follows:  
VOLUME → Fully counterclockwise ( $\infty$ )  
TONE → DEFEAT  
BASS, TREBLE, BALANCE → Center (zero)  
LOUDNESS, DC COUPLED → OFF  
ATTENUATOR → 0  
MODE → STEREO  
TAPE → SOURCE  
Unplug headphones from the PHONES jack.  
Turn POWER ON.

## TUNER

1. Set the INPUT SELECTOR switch to TUNER.
2. Operate the tuner as usual.

## VOLUME, TONE, BALANCE AND LOUDNESS

1. Turn up VOLUME to the desired listening level.
2. Set the TONE switch to ON.
3. Adjust BASS and TREBLE to suit your taste.
4. If an imbalance occurs (the left or right channel appears louder than the other) due to source imbalance or room acoustics, adjust BALANCE to equalize the sound from both speakers.
5. If you normally listen at low volume levels, advance LOUDNESS switch to 3 or 6 dB. These settings may also be used to compensate for small speaker enclosures or room acoustics where very low bass notes appear deficient.

## ATTENUATOR and DC COUPLED switches

1. Set the ATTENUATOR switch to 0. Use the -20 dB setting to interrupt audio momentarily for such purposes as answering the phone, etc.
2. Set the DC COUPLED switch ON for flat low frequency response; set it OFF if the program source has excessive low-frequency rumble.

## TURNTABLES

1. Set the INPUT SELECTOR to PHONO 1 or PHONO 2 to select audio from turntables connected to the PHONO 1 and/or PHONO 2 jacks respectively.
2. Operate the selected turntable.
3. Adjust volume and tone controls for your preference.

## AUX

1. Set the INPUT SELECTOR switch to AUX.
2. Operate the component or accessory connected to the AUX jacks.
3. Adjust volume and tone for your preference.

## TAPE DECKS

### Tape Playback

1. Set the TAPE switch to A PLAY or B PLAY, to select output from tape decks connected to the TAPE A or B jacks (The setting of the INPUT SELECTOR switch affects speaker output only when the TAPE switch is set to SOURCE).
2. Operate the tape deck.
3. Adjust volume and tone for your preference.

### Monitoring

If tape deck is equipped with three heads, you can compare the sound quality of the recording in progress with that of the source material by switching the TAPE switch between SOURCE and A PLAY (or B PLAY) while the recording is being made.



# OPERATING INSTRUCTIONS

## Recording (one tape deck)

1. Set the INPUT SELECTOR switch to the desired program source. Set the TAPE switch to SOURCE. To monitor the recording, set the TAPE switch to A PLAY or B PLAY depending on the set of jacks to which your tape deck is connected.
2. Set up your tape deck for recording and set recording levels with the controls on your tape deck. The volume control and tone controls on the amplifier do not affect the signal applied to the tape deck for recording purposes.
3. Adjust listening level and tone at the amplifier for your preference in monitoring the signal; these settings will not affect the recording.

## Recording (two tape decks)

1. Set the INPUT SELECTOR switch to the desired program source.
2. Set the TAPE switch to SOURCE.
3. Recordings can now be made on both tape decks simultaneously.  
To monitor these recordings, use the TAPE switch as follows: Set it to "B PLAY" to monitor the recording being made in the tape deck connected to TAPE B jacks.

### Note:

In case of recording with two tape decks, a source signal can not be recorded in the tape deck connected to "B PLAY" jacks when the TAPE switch is set to "A PLAY". Therefore, be sure to set the TAPE switch to "SOURCE" or "B PLAY" only.

4. Recording levels should be set using the controls on the individual tape decks.

## Tape-to-Tape Dubbing (A > B)

Tape recordings may be duplicated easily using tape deck A to play the prerecorded tape and tape deck B to record the copy. Set the TAPE switch as follows:

**B MON:** To record a copy on tape deck B from a tape played on tape deck A and monitor the recording in progress.

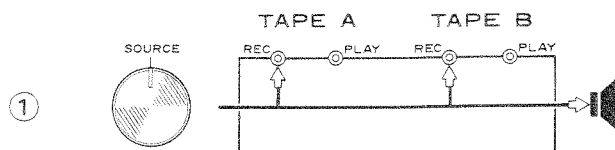
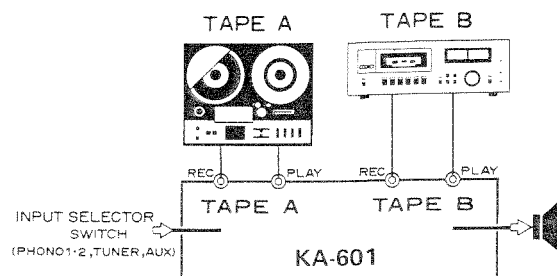
**SOURCE MON:** To record a copy on tape deck B from a tape played on tape deck A. This position permits listening to other program sources such as FM or phono during the dubbing operation.

### Note:

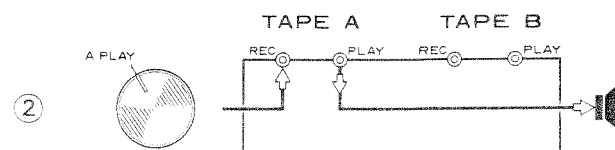
The setting of the INPUT SELECTOR switch does not affect this operation.

Adjust record levels on the deck that is making the copy using that deck's operating controls.

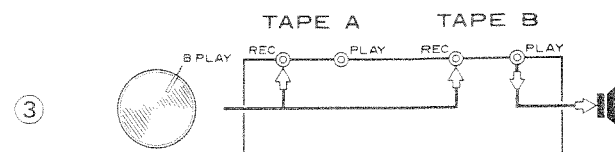
Start both decks (play and record) simultaneously.



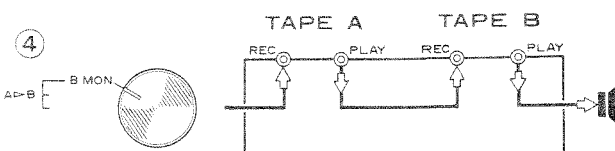
**Tape Recording :** The input signal selected by the INPUT SELECTOR switch is always present at a fixed level at the TAPE A and TAPE B REC jacks.



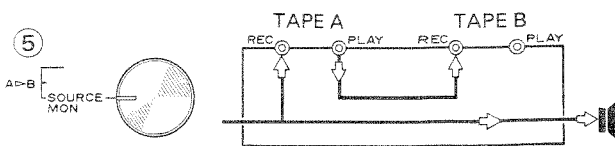
**Tape Playback :** Playback signal enters TAPE A PLAY jacks, and is heard from the speakers.



**Tape Playback :** Playback signal enters TAPE B PLAY jacks, and is heard from the speakers.



**Dubbing :** Playback signal from tape deck A enters via TAPE A PLAY jacks, passes through TAPE switch B MON, and is recorded by tape deck B.



**Dubbing :** Playback signal from tape deck A enters via TAPE A PLAY jacks, passes through TAPE switch SOURCE MON, and is recorded by tape deck B. In addition, this position makes it possible for a different signal source such as an FM broadcast or phono to be reproduced through the speakers.

# SAFETY PRECAUTIONS

## CLEANING

Do not use volatile solvents such as alcohol, paint thinner, gasoline, benzine, etc. to clean the cabinet. Use a silicon cloth or a clean dry cloth.

## VENTILATION HOLES

The case top is slotted to allow ventilation. Never block these holes with ornamental cloths, books or other objects. Make sure that metal objects such as coins, hairpins, or needles do not enter the unit through the ventilation holes. The result could be a serious malfunction or a possible shock hazard. Make sure that children do not insert foreign objects into the ventilation holes.

## MODIFICATIONS AND SERVICE

Each unit is shipped after it has been carefully adjusted and tested to provide optimum performance. The unit must not be modified internally. Unauthorized modifications will void the terms of the warranty. High voltages are used in some of the internal circuits. Therefore, do not remove the cabinet or touch internal parts. Refer all service to qualified service personnel.

## POWER CORD

Always insert or remove the power plug from the AC outlet by grasping the plug body. Never pull or stretch the cord. Take care that the cord is not subject to traffic or bent sharply around furniture. Keep heavy objects off the cord; never route it under rugs, and avoid the use of extra extension cords. Attention to these precautions will avoid fire or shock hazards.

## SPEAKER-SYSTEM PROTECTION

Your KA-601 is capable of supplying very high power to your speakers. To prevent speaker damage due to accidental surges, such as may be caused by inadvertently dropping the stylus onto a record, make it a habit to reduce volume before changing records, switching between program sources or turning power ON.

Check the power-handling ability of your speakers and make sure that the power supplied is within their limits. Excessive power can permanently damage your speakers.

## ACOUSTIC FEEDBACK

Occasionally a disturbing howling sound caused by acoustic feedback, may be heard. This is generally caused by the relative positions of the turntable and speaker enclosures. The sound pressure radiated from the speaker surrounds and vibrates the turntable.

This vibration is picked up by the cartridge, sent to the unit as an electrical signal, and returned to the speaker. This again causes the speakers to radiate vibration which induces sympathetic vibrations in the turntable and cartridge. Sympathetic vibrations are reinforced with each repeating cycle and result in an undesirable sound called oscillation or "howling". To prevent it, keep your turntable away from your speakers. Also mounting your turntable on shock-absorbing pads may help.

## IN CASE OF DIFFICULTY

If your amplifier does not operate as expected, the cause may be some error in system connections or control settings. Consult the table below to see if the problem can be corrected. If trouble persists consult your Kenwood dealer or service representative.

AM, FM, PHONO or Tape Playback	CAUSE	REMEDY
No sound although AC is switched On. Power LED is not illuminated.	Poor AC plug connection.	Check plug connection. Make sure AC outlet is active.
No sound from LEFT and RIGHT.	a) Speaker cords disconnected. b) SPEAKERS switch set to OFF. c) Volume Control (fully CCW). d) TAPE switch set to A PLAY or B PLAY.	a) Check connections from amp. output to speakers. b) SPEAKERS switch should be switched to OFF only when using stereo headphones. c) Set to appropriate volume level. d) Always set to SOURCE except when using tape decks.
Sound from one side only.	a) Poor speaker cord connections. b) BALANCE control set to one extreme.	a) Check amp. output and speaker connections. b) Adjust BALANCE control.
Difference in volume level between tuner and phono.	Difference in received signal and phono output levels.	May be normal. Adjust tuner output, if possible.
During Phono Playback Only	CAUSE	REMEDY
No sound from LEFT and RIGHT, or sound only from one side.	Turntable output cord disconnected.	See that turntable output cord is firmly plugged into amp. input.
Loud hum drowns out sound.	Poor turntable output cord plug-shell connections.	See that plugs are inserted fully so that outer shells make contact.
Sound audible but background hum occurs.	a) Turntable output cord picking up hum from AC cord. b) Turntable not grounded.	a) Keep turntable output cord away from AC cords. Choose cord paths which keep hum at a minimum. Reverse turntable AC plug connections. b) Connect ground wire to GND terminal.
Sound audible but continuous background buzz interferes.	TV signal picked up by Turntable output cord. Frequently occurs near TV transmitting antenna.	Route turntable cord so that hum is minimized.
Howling noise occurs when volume is raised or bass response is increased.	Speaker vibrations induce feedback in Pickup.	Increase distance between turntable and speakers. Choose speaker locations carefully.

# SPECIFICATIONS

## AUDIO SECTION

### Rated Output Power (FTC)

8 ohms at 20 Hz to 20 kHz ..... 60 W + 60 W

### Maximum Output Power (DIN)

1% THD with 4 ohms loads, 1 kHz ..... 90 W + 90 W

### Total Harmonic Distortion

Rated Output Power into 8 ohms ..... 0.02%

Intermodulation Distortion ..... 0.004%

Power Bandwidth (at 0.03% THD) ..... 5 Hz ~ 40 kHz

Frequency Response ..... DC ~ 400 kHz +0 dB, -3 dB

### S/N Weighted: Rated Output Power (IEC-A)

( ) = Unweighted, at 50 mW, (DIN)

Phono ..... 87 dB (60 dB)

Tuner, Aux, Tape ..... 105 dB (60 dB)

Damping Factor ..... 100

### Input Sensitivity/Impedance

Phono ..... 2.5 mV/50 kohms

Tuner, Aux, Tape ..... 200 mV/50 kohms

### Tone Control

Bass 100 Hz .....  $\pm 7.5$  dB

Treble 10 kHz .....  $\pm 7.5$  dB

Loudness Control (-30 dB) ..... 100 Hz +3 dB

100 Hz +6 dB

## GENERAL

Power Consumption ..... 550 W

Dimensions ..... W 440 mm

H 153 mm

D 407 mm

Weight (Net) ..... 11.5 kg

**Note:** Kenwood follows a policy of continuous advancements in developments. For this reason specifications may be changed without notice.



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